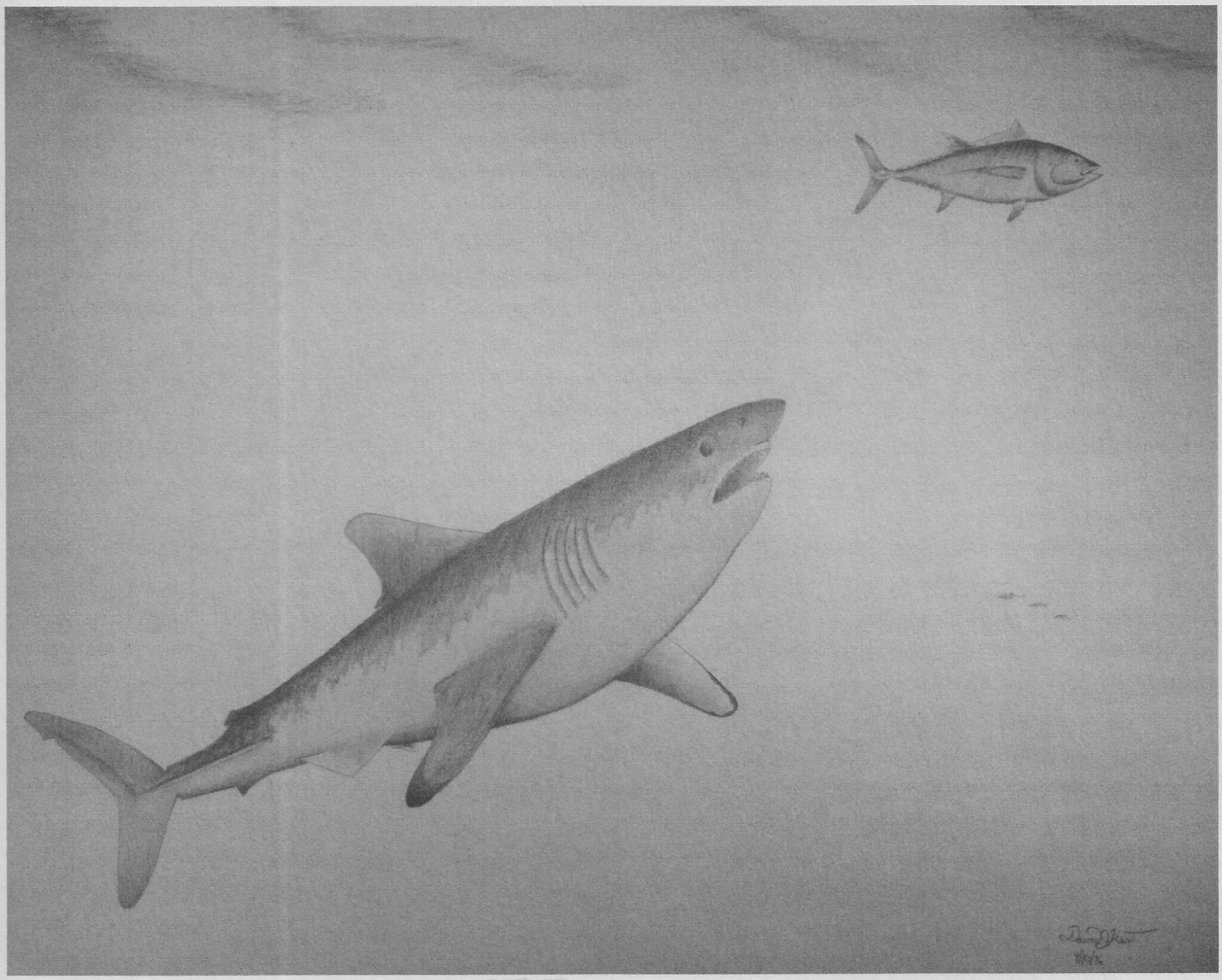
# THE MOSASAUR



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# *Cretolamna* cf. *C. aschersoni* (Stromer) (Neoselachii: Cretoxyrhinidae), from the Late Paleocene/Early Eocene of Mississippi, USA, with Comparisons to Moroccan Fauna

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ABSTRACT — The recent discovery of fossil fish material from the Tuscahoma and Bashi Formations in the State of Mississippi has brought to light a varied fauna of Late Paleocene/Early Eocene age. The fauna is comprised of many species that demonstrate a strong correlation to North African and European species types. Among the North African species we find teeth of a fossil shark which compares favorably with *Cretolamna aschersoni* (Stromer) which, up until now, had primarily been found in the Early Eocene (Ypresian Stage) of Morocco (Arambourg 1952). This paper presents teeth comparable to *Cretolamna aschersoni* in the fossil record of the North American continent.

## Introduction

The purpose of this paper is to report the occurrence in the Late Paleocene/Early Eocene of North America (Mississippi) of a fossil shark tooth type comparing favorably with *Cretolamna aschersoni* of Morocco. Along with the teeth of *Cretolamna aschersoni*, the following North African selachian types are also found in Mississippi: *Odontaspis speyeri* (Dartevelle et Casier); *Ginglymostoma subafricanum* Arambourg; and *Burnhamia fatahi* Cappetta, among others.

Typical European species which are found in the two formations of Mississippi, are: *Cretolamna lerichei* (Casier); *Carcharias teretidens* (White); *Carcharias substriatus* (Stromer); *Carcharias hopei* (Agassiz); *Odontaspis winkleri* (Leriche) *Striatolamia macrota* (Agassiz) *Jaekelotodus* sp.; *Anomotodon* sp.; *Abdounia beaugei* (Arambourg); *Abdounia subulidens* (Arambourg); *Rhizoprionodon* sp.; *Galeorhinus affinis* (Probst); *Galeorhinus lefevrei* (Daimeries); *Galeorhinus minor* (Agassiz); *Galeorhinus ypresiensis* Casier; *Galeus* sp.; *Physogaleus tertius* (Winkler); *Burnhamia daviesi* (Woodward); *Coupatezia woutersi* Cappetta; *Eotorpedo jaekeli* White; *Dasyatis jaekeli* (Leriche); *Pristis* sp.; *Rhinoptera* sp.; *Myliobatis dixoni* Agassiz and *Myliobatis* sp. The senior author has recently published a paper (Case, 1994) dealing with the entire selachian fauna of both the Tuscahoma and Bashi Formations, among which are presented two new genera and ten new species of selachians, as well as the *Cretolamna aschersoni* described in this paper.

## Geology

Keady (1962) stated that the Tuscahoma Formation was essentially a deposition of deltaic, fluviatile and paludal sediments. Dockery et al. (1984) stated that the Tuscahoma Formation lacks fossils, although the senior author (Case, 1986, 1994) has proven beyond a doubt that the Tuscahoma Formation in Mississippi does in fact contain a rich and varied marine fauna comprised of selachians and bony fish.

Overlying the Tuscahoma Formation at the fossil locality of this report is the Bashi Formation which is also fossiliferous and which also contains many of the species mentioned in the introduction. *Cretolamna* cf. *C. aschersoni* is found in both the Bashi as well as in the Tuscahoma Formation, and is much more commonly distributed in the latter.

The fossil locality of this report and that of Case (1994) is situated in a bluff behind the Red Hot Truck Stop, off the Frontage road, in Meridian, Lauderdale County, Mississippi. The topographic map reference for this site is on the Meridian South Quadrangle, 7.5 minute series, R16E, T6N, Sect. 20, NW1/4, NE1/4. The exposure of the fossiliferous layer of the Tuscahoma Formation is approximately 3 meters up from Crawdaddy Creek, a small tributary or drainage ditch named by the senior author (Case, 1986).

The fish bed is from 2.5mm to 7.5mm in thickness at that height. An additional 3.5 meters is attributed to the Tuscahoma Formation above the fossil fish zone. Some of the clay layers contain leaf impressions (willow and pine needles). Approximately 1.25 meters above this is the top of the Bashi Formation ("boulder zone"). The above measurements were taken in the field at Meridian, Mississippi, by Dr. David T. Dockery III, of the Mississippi Bureau of Geology, Jackson, Mississippi, on the 26th of April 1990.

## Systematics

**Class**: Chondrichthyes
**Subclass**: Elasmobranchii
**Order**: Lamniformes
**Family**: Cretoxyrhinidae Glickman, 1958
**Genus**: *Cretolamna* Glickman, 1958
*Cretolamna* cf. *C aschersoni* (Stromer 1905)
Plate 1, figs. 1-6; and Moroccan material for comparison in Plate 2, figs. 1-6.
**Material**: 6 teeth (3 upper lateral teeth, 3 lower anterior teeth).
**Locality**: Red Hot Truck Stop, Meridian, Lauderdale County, Mississippi, USA.
**Age**: Tuscahoma Formation (Late Paleocene, Thanetian Stage); Bashi Formation (Lower Eocene, Ypresian Stage).
**Description**: Three specimens of upper Jaw teeth, one possibly of an antero-lateral tooth (plate 1, fig. 1), while the others are all lateral teeth (plate 1, figs. 2, 3), averaging about 2cm to 2.5cm in slant height. Each tooth exhibits a strongly recurved central blade, with side cusplets, directed towards the commissure of the jaw (Plate 1, figs. 1-3). Three lower jaw teeth (plate 1, figs. 4-6), all anterior, display a symmetrical central blade with lateral cusps, averaging about 2cm to 2.5cm in overall height. All teeth, whether they be upper or lower, have divergent lateral (side) cusps. Depending upon the position within the jaw, some teeth possess more than one side cusp, or at the very least an aberrant cusplet near to an existing lateral cusp.

Plate 2, figs. 1-6, show comparative specimens (3 upper laterals and 3 lower anteriors) from the Lower Eocene, Ypresian Stage, of the Kingdom of Morocco, in North Africa. Note that the side cusps of the teeth of *Cretolamna aschersoni* from Morocco seem to be much more strongly divergent ("curving") than those found in Mississippi, but essentially this is the very same species.

**Discussion:** Case and Cappetta (1990) state that the status of *Cretolamna aschersoni* is quite confusing due to a poor definition of the species by Stromer (1905) and an extension of this specific name to other species of a different age. The teeth originally described by Stromer (1905) from the Middle and Late Eocene of Egypt have been determined by Case and Cappetta (1990) to belong to *Cretolamna twiggsensis*. According to Case (1981), the only lamnid found in the Middle and Late Eocene of Egypt is *C. twiggsensis*. The suite of teeth redescribed by Leriche (1906) under the name of *Lamna aschersoni*, as well as those figured by Arambourg (1952) from the Lower Eocene of Morocco, are indeed the proper representatives of *Cretolamna aschersoni*. The teeth, *Lamna gafsana* as described by White (1926), are probably synonymous with *C. aschersoni*.

The occurrence of *Cretolamna* cf. *C. aschersoni* in North America is presented here. The authors further note that the remarkable similarities in species types found between the east coast of North America (Mississippi), and the west coast of Africa, would seem to suggest that both these continents were at one time much closer together since the fauna mentioned is not comprised of transoceanic species, but made up of coastal varieties. The authors acknowledge that more research needs to be done in the area of marine fossils, and their relationship to continental drift.

The specimens used in this report are in the private collection of the senior author.

## Acknowledgments

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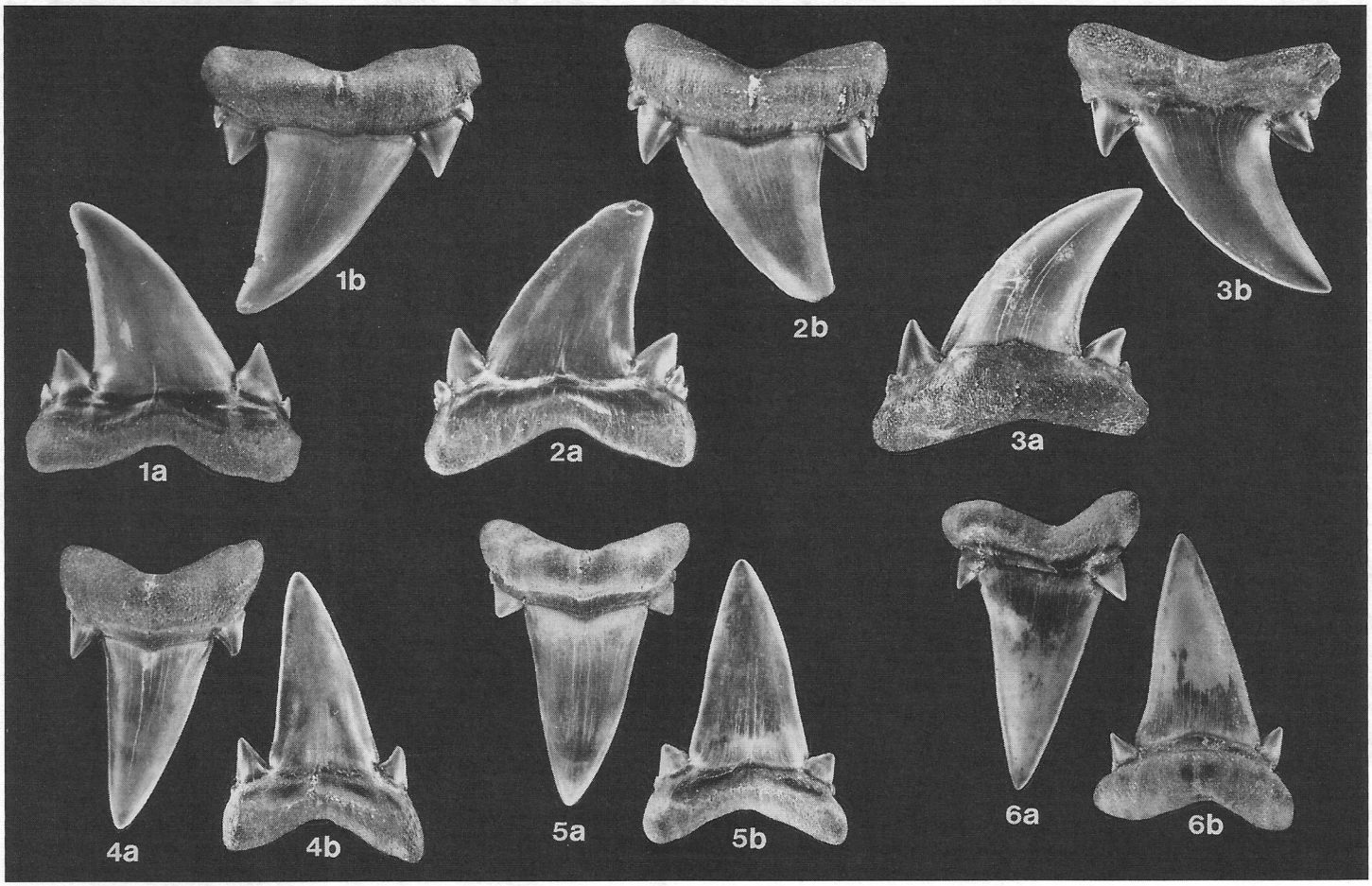


**Plate 1.** *Cretolamna* cf. *C. aschersoni* (Stromer). Fig. 1. An upper right lateral tooth. a. Lingual view. b. Labial view (x2), 2. An upper left lateral tooth. a. Lingual view. b. Labial view (x2), 3. An upper left antero-lateral tooth a. Labial view. b. Lingual view (x2), 4. A lower anterior tooth. view. a. Labial view b. Lingual view (x2), 5. A lower jaw anterior. tooth a. Labial view. b. Lingual view (x2), 6. A lower jaw anterior tooth. a. Lingual view. b. Labial view (x2). All specimens are from the Tuscahoma Formation of Mississippi.

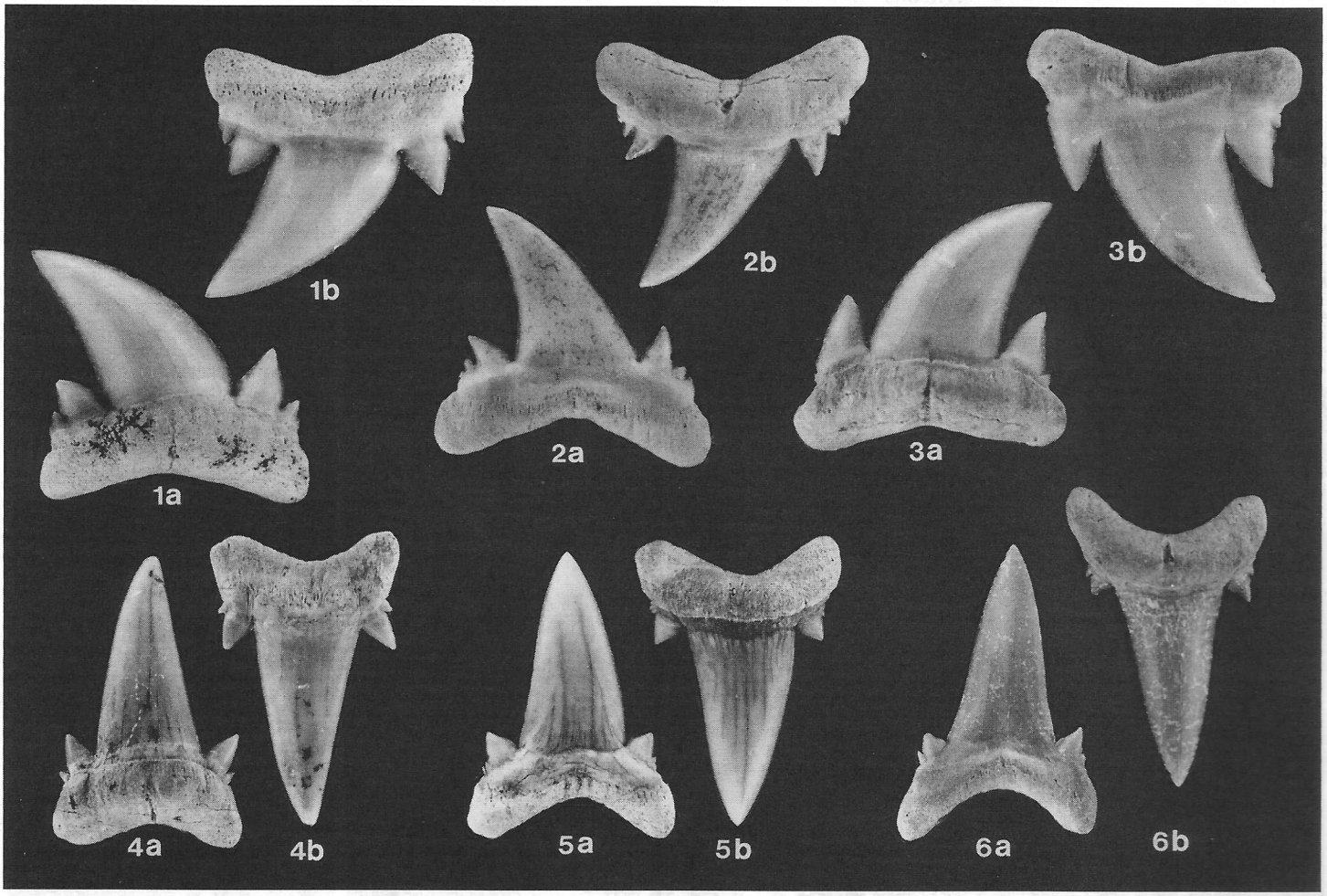


**Plate 2.** *Cretolamna aschersoni* (Stromer). Fig. 1. An upper left lateral tooth. a. Labial view. b. Lingual view (x2), 2. An upper left lateral tooth. a. Lingual view. b. Labial view (x2), 3. An upper right lateral tooth. a. Labial view. b. Lingual view (x2), 4. A lower jaw anterior tooth. a. Labial view. b. Lingual view (x2), 5. A lower jaw anterior tooth. a. Lingual view. b. Labial view (x2), 6. A lower jaw anterior tooth. a. Lingual view. b. Labial view (x2).
Plate 2 specimens are all from Sidi Daoui, Oulad Abdoun Basin, Morocco, and are comparative specimens for Plate 1 material from Mississippi.